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8 **APPLICATION**  
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14 **FOR UNITED STATES LETTERS PATENT**  
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24 **SPECIFICATION**  
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## Sliding Quick Attach System

## CROSS REFERENCE TO RELATED APPLICATIONS

Two other utility patent applications are being filed with the USPTO simultaneously with this application identified by Attorney Docket Numbers GROU-010 and GROU-012.

**STATEMENT REGARDING FEDERALLY  
SPONSORED RESEARCH OR DEVELOPMENT**

Not applicable to this application.

## **BACKGROUND OF THE INVENTION**

## Field of the Invention

The present invention relates generally to implement attachment devices and more specifically it relates to a sliding quick attach system for allowing sliding movement of the implement while providing quick attachment and release of the implement.

1    **Description of the Related Art**

2

3        Conventional implement mounting arrangements have been in use for years for  
4        mounting various types of implements to tractors and like vehicles. Implements  
5        mounted to these structures range from loaders, blades, belly blades, rollers, brushes  
6        and the like. A typical implement mounting arrangement is the front-end loader  
7        commonly utilized upon small to large tractors. Another type of implement mounting  
8        arrangement is comprised of a belly structure that is attached beneath the frame of a  
9        tractor preferably capable of operating about various axes to provide lift, roll, pitch  
10      and yaw to an implement.

11

12       A conventional method of attaching implements to the implement mounting  
13       structure is by conventional fasteners such as pins and the likes. However, this  
14       mounting process is time consuming to attach and disconnection an implement. A  
15       solution to this problem has been developed utilizing “quick attach” devices.

16

17       A popular quick attach product is produced under the BOBCAT brand by  
18       INGERSOLL-RAND        called        the        BOB-TACH        SYSTEM  
19       (<http://www.bobcat.com/products/att/index.jhtml>). The BOB-TACH SYSTEM utilizes  
20       an upper hook structure that catchably engages an upper flange of the implement and a  
21       wedge structure that is extended through an aperture within a lower lip of the  
22       implement. The BOB-TACH SYSTEM allows for quick attaching and release of an  
23       implement. The main problem with the BOB-TACH SYSTEM is that it does not allow  
24       the implement to slide from side-to-side when attached to the loader.

25

26       While these devices may be suitable for the particular purpose to which they  
27       address, they are not as suitable for allowing sliding movement of the implement while  
28       providing quick attachment and release of the implement. Conventional quick  
29       attachment structures do not allow for sliding movement of an implement.

1

2        In these respects, the sliding quick attach system according to the present  
3 invention substantially departs from the conventional concepts and designs of the prior  
4 art, and in so doing provides an apparatus primarily developed for the purpose of  
5 allowing sliding movement of the implement while providing quick attachment and  
6 release of the implement.

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## **BRIEF SUMMARY OF THE INVENTION**

In view of the foregoing disadvantages inherent in the known types of quick attach structures now present in the prior art, the present invention provides a new sliding quick attach system construction wherein the same can be utilized for allowing sliding movement of the implement while providing quick attachment and release of the implement.

The general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new sliding quick attach system that has many of the advantages of the quick attach structures mentioned heretofore and many novel features that result in a new sliding quick attach system which is not anticipated, rendered obvious, suggested, or even implied by any of the prior art quick attach structures, either alone or in any combination thereof.

To attain this, the present invention generally comprises a support frame, a first brace and a second brace extending upwardly from the support frame, a catch member attached to the upper ends of the braces, a first latch structure and a second latch structure attached near opposing ends of the support frame, and an implement unit having an upper lip and a lower lip with at least one slot. The locking pin of the latch structure slidably extends within the slot within the lower lip of the implement unit for retaining the implement unit while allowing side-to-side movement of the implement unit.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the invention that will be described hereinafter and that will form

1 the subject matter of the claims appended hereto.

2

3 In this respect, before explaining at least one embodiment of the invention in  
4 detail, it is to be understood that the invention is not limited in its application to the  
5 details of construction and to the arrangements of the components set forth in the  
6 following description or illustrated in the drawings. The invention is capable of other  
7 embodiments and of being practiced and carried out in various ways. Also, it is to be  
8 understood that the phraseology and terminology employed herein are for the purpose  
9 of the description and should not be regarded as limiting.

10

11 A primary object of the present invention is to provide a sliding quick attach  
12 system that will overcome the shortcomings of the prior art devices.

13

14 A second object is to provide a sliding quick attach system for allowing sliding  
15 movement of the implement while providing quick attachment and release of the  
16 implement.

17

18 Another object is to provide a sliding quick attach system that may be utilized  
19 with various types of implements including but not limited to blades, plows, brushes  
20 and the like.

21

22 An additional object is to provide a sliding quick attach system that may be  
23 utilized with various types of tractors and like vehicles.

24

25 Other objects and advantages of the present invention will become obvious to the  
26 reader and it is intended that these objects and advantages are within the scope of the  
27 present invention.

1        To the accomplishment of the above and related objects, this invention may be  
2   embodied in the form illustrated in the accompanying drawings, attention being called  
3   to the fact, however, that the drawings are illustrative only, and that changes may be  
4   made in the specific construction illustrated and described within the scope of the  
5   appended claims.

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## **BRIEF DESCRIPTION OF THE DRAWINGS**

Various other objects, features and attendant advantages of the present invention will become fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein:

FIG. 1 is a rear upper perspective view of the present invention with a blade implement attached.

FIG. 2 is a rear upper perspective view of the present invention.

FIG. 3 is a magnified upper perspective view of the latch structure.

FIG. 4a is a magnified upper perspective view of the latch structure fully engaged with the implement unit.

FIG. 4b is a magnified upper perspective view of the latch structure with the lever member released from the engaging portion.

FIG. 4a is a magnified upper perspective view of the latch structure with the lever member rotated thereby retracting the locking pin from within the slot of the implement unit.

FIG. 5a is a side view of the latch structure fully engaged with the implement unit.

1 FIG. 5b is a side view of the latch structure with the lever member released.

2

3 FIG. 5c is a side view of the latch structure with the lever member rotated

4 thereby retracting the locking pin from within the slot of the implement unit.

5

6 FIG. 5d is a side view of the lower portion of the implement unit being rotated

7 outwardly away from the latch structure for removing the implement unit.

8

9 FIG. 6 is a bottom view of the present invention supporting an implement unit.

10

11 FIG. 7a is a top view of the present invention with the implement unit being

12 slid to the left.

13

14 FIG. 7b is a top view of the present invention with the implement unit being

15 slid to the right.

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1

## 2 DETAILED DESCRIPTION OF THE INVENTION

3

### 4 A. Overview

5 Turning now descriptively to the drawings, in which similar reference  
6 characters denote similar elements throughout the several views, FIGS. 1 through 7b  
7 illustrate a sliding quick attach system **10**, which comprises a support frame **60**, a first  
8 brace **70** and a second brace **72** extending upwardly from the support frame **60**, a catch  
9 member **74** attached to the upper ends of the braces, a first latch structure **40** and a  
10 second latch structure **40** attached near opposing ends of the support frame **60**, and an  
11 implement unit **20** having an upper lip **22** and a lower lip **24** with at least one slot **30**.  
12 The locking pin **50** of the latch structure **40** slidably extends within the slot **30** within  
13 the lower lip **24** of the implement unit **20** for retaining the implement unit **20** while  
14 allowing side-to-side movement of the implement unit **20**.

15

### 16 B. Support Frame

17 As shown in Figure 2 of the drawings, the support frame **60** is an elongate  
18 structure having a lower edge. The lower edge is formed for slidably receiving an  
19 inner portion of the lower lip **24** of the implement unit **20**. The lower edge is  
20 preferably comprised of a flat and straight structure for allowing sliding movements  
21 adjacent thereto by the implement unit **20**.

22

23 As shown in Figure 2 of the drawings, a first brace **70** and a second brace **72**  
24 extend between the support frame **60** and the catch member **74**. The first brace **70** and  
25 the second brace **72** preferably have a connecting structure capable of connecting to a  
26 support structure such as a front-end loader. It can be appreciated that various other  
27 brace structures may be utilized within the present invention.

28

1      **C.      *Catch Member***

2              The catch member **74** is preferably comprised of an elongate structure as shown  
3      in Figure 2 of the drawings. The catch member **74** preferably is attached to the support  
4      frame **60** substantially parallel to the lower edge as further shown in Figure 2 of the  
5      drawings.

6

7              The catch member **74** is preferably comprised of a rod structure as best shown  
8      in Figure 2 of the drawings. The catch member **74** may have various cross sectional  
9      shapes, however it is preferable to have a circular cross sectional shape for the catch  
10     member **74** as shown in Figure 2 of the drawings. The catch member **74** preferably has  
11     a straight structure for allowing the implement unit **20** to slide upon the catch member  
12     **74**. It can be appreciated that the catch member **74** may be separated into two or more  
13     separate segments.

14

15      **D.      *Latch Structure***

16              As shown in Figure 2 of the drawings, at least one latch structure **40** is attached  
17      to the support structure for securing the implement unit **20**. As shown in Figure 2, it is  
18      preferable to have two opposing latch structures **40** attached to the support frame **60**,  
19      however various other numbers and combinations of latch structures **40** may be  
20      utilized.

21

22              The latch structure **40** preferably has a housing structure that slidably receives a  
23      locking pin **50** having a tapered portion **52** as shown in Figure 3 of the drawings. The  
24      locking pin **50** extends through an opening within the support frame **60**. The locking  
25      pin **50** preferably has a rectangular cross section for being slidably received within the  
26      slot **30** of the lower lip **24**. The locking pin **50** has a width slightly smaller than a  
27      width of the slot **30** as best illustrated in Figure 5b of the drawings.

28

1        The latch structure **40** further includes a lever member **42** attached to the  
2 locking pin **50** via a connecting member **46** for manipulating the locking pin **50**. The  
3 connecting member **46** extends through an opening within the housing of the latch  
4 structure **40** and is attached to the locking pin **50**.

5

6        A lever member **42** is movably attached upon the connecting member **46** as  
7 shown in Figure 3 of the drawings. The lever member **42** has a handle portion and a  
8 leverage portion that selectively engages the support frame **60** for allowing the user to  
9 manipulate the position of the locking pin **50**.

10

11       A bias member **48**, preferably a compression spring, is attached between a  
12 broad head of the connecting member **46** and the leverage member for applying an  
13 inward force to the leverage member. The latch structure **40** includes a cutout forming  
14 an engaging portion **44** for securing the lever member **42** in a locked position. The  
15 bias member **48** retains the lever member **42** within the locked position within the  
16 engaging portion **44** as shown in Figures 2 and 5a of the drawings.

17

18       **E. Implement Unit**

19       The implement unit **20** may be comprised of any type of implement such as but  
20 not limited to a blade, plow, bucket, brush and the like. The implement unit **20** has a  
21 frame having an upper lip **22** and a lower lip **24** as shown in Figure 1 of the drawings.  
22 The upper lip **22** removably and slidably engages the catch member **74**.

23

24       As shown in Figures 5a through 5d of the drawings, the upper lip **22** has a  
25 shape similar to the shape of the catch member **74**, such as circular. The upper lip **22**  
26 has an opening for receiving and releasing the catch member **74** such as a hook  
27 structure. The upper lip **22** preferably extends along a significant length of the  
28 implement unit **20** to provide adequate support and sliding room for the implement  
29 unit **20**.

The lower lip **24** extends from a lower portion of the implement unit **20** as best shown in Figures 5a through 5d of the drawings. The lower lip **24** preferably extends a significant distance along the implement unit **20** as best illustrated in Figure 1 of the drawings. The lower lip **24** is formed for being slidably positioned adjacent the lower edge of the support frame **60**.

### *F.*      *Slot*

At least one slot 30 is positioned within the lower lip 24 as shown in Figures 1 and 6 of the drawings. The slot 30 extends longitudinally within the lower lip 24 and receives the locking pin 50 from the latch structure 40.

As shown in Figure 6 of the drawings, the slot 30 preferably extends at least along fifty-percent of the length of the lower lip 24 to provide adequate sliding capabilities for the implement unit 20. The slot 30 is also preferably comprised of a straight and elongate structure as further shown in Figure 6 of the drawings.

## G. Actuator Unit

As shown in Figure 1 of the drawings, an actuator unit 62 is attached between the support frame 60 and the implement unit 20 for applying a side-to-side force to the implement unit 20. The actuator unit 62 is preferably comprised of a hydraulic unit, however various other actuator structures may be utilized. The actuator unit 62 is connected to the implement unit 20 by a pin or other connection means that allows for easy disconnection and connection thereof.

### *H. Operation*

With the implement unit **20** attached, the user is able to perform the normal four movements thereof: lift, pitch, roll and yaw. In addition to the normal four movements, the user is able to perform a fifth movement: sliding from side-to-side.

1 The user simply extends/retracts the actuator unit **62** to move the implement unit **20** to  
2 the desired side as shown in Figures 7a and 7b of the drawings. The locking pin **50**  
3 retains the implement unit **20** attached to the support frame **60** while sliding freely  
4 within the slot **30**.

5

6 To remove an implement unit **20** from the support frame **60**, the user first pulls  
7 upon the lever member **42** to release the same from the engaging portion **44** as shown  
8 in Figures 4b and 5b of the drawings. The user then rotates the lever member **42**  
9 upwardly thereby causing the locking pin **50** to retract from the slot **30** as shown in  
10 Figures 4c and 5c of the drawings. After the locking pin **50** is fully removed from the  
11 slot **30** within the lower lip **24**, the user may then pivot the lower portion of the  
12 implement unit **20** away from the support frame **60** as shown in Figure 5d of the  
13 drawings. After the lower lip **24** is a sufficient distance from the support frame **60**, the  
14 user may then either lower the support frame **60** or raise the implement unit **20** to  
15 disengage the upper lip **22** from the catch member **74**. To attach a new implement unit  
16 **20**, the above procedure is simply reversed.

17

18 As to a further discussion of the manner of usage and operation of the present  
19 invention, the same should be apparent from the above description. Accordingly, no  
20 further discussion relating to the manner of usage and operation will be provided.

21

22 With respect to the above description then, it is to be realized that the optimum  
23 dimensional relationships for the parts of the invention, to include variations in size,  
24 materials, shape, form, function and manner of operation, assembly and use, are  
25 deemed to be within the expertise of those skilled in the art, and all equivalent  
26 structural variations and relationships to those illustrated in the drawings and  
27 described in the specification are intended to be encompassed by the present invention.

28

1       Therefore, the foregoing is considered as illustrative only of the principles of  
2   the invention. Further, since numerous modifications and changes will readily occur to  
3   those skilled in the art, it is not desired to limit the invention to the exact construction  
4   and operation shown and described, and accordingly, all suitable modifications and  
5   equivalents may be resorted to, falling within the scope of the invention.

6